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ABSTRACT

This environmental education plan, developed for the State of New Hampshire, is based on the premise that environmental education is most likely to be meaningful if implemented into the schools at the local level. The purpose of this publication is threefold: first, to define environmental education and comment on environmental education methodologies and facilities appropriate for use in school programs; second, to recommend courses of action essential to the realization of New Hampshire's priority environmental education needs; and to outline a strategy for promoting citizen involvement in environmental education. The plan contains the following sections: Introduction, Places for K-12 Environmental Education, Recommended Courses of Action, Community Environmental Education Plan, and Annotated Bibliography. The policy statement of the New Hampshire State Board of Education relative to environmental education is appended. (BT)

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ENVIRONMENTAL EDUCATION

FOR NEW HAMPSHIRE:

A PLAN FOR COMMUNITY INVOLVEMENT

SE 018 127

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ENVIRONMENTAL EDUCATION FOR NEW HAMPSHIRE:

A PLAN FOR COMMUNITY INVOLVEMENT

Submitted to:

NH DEPARTMENT OF EDUCATION
NH COLLEGE AND UNIVERSITY COUNCIL
NH COOPERATIVE EXTENSION SERVICE
SOCIETY FOR THE PROTECTION OF NH FORESTS
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ADDENDA

Issued as Separate Publications

1973 Needs Assessment Report August 1973

Environmental Education Resources and Programs September 1973

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In biological history, no organism has survived long if its environment became in some way unfit for it. But no organism before man has deliberately polluted its own environment.
—Rachel Carson

INTRODUCTION

The need for environmental education in New Hampshire becomes obvious when one considers the many environmental issues facing our state. For example:

--New Hampshire's major river systems are among the most polluted in the country. Continued effort is needed to bring them up to federal water quality standards and to minimum standards of human decency.

--New Hampshire is one of the fastest growing states in the country. Though predominantly rural, it is experiencing rapid and often uncontrolled growth, particularly in the southern portion of the state, and in the north around our lakes and other recreational resources. Continued planning is needed in order to manage this growth in the best interest of the state.

--In many areas of the state development and construction are taking place on sites which are not suited to intensive use. In too many towns there are no zoning ordinances, and in many of the towns which do have them they are outdated.[1]

In light of these issues and in view of the fact that ecological concerns have yet to be integrated into the curriculum of a significant number of New Hampshire schools, the Environmental Education Planning Council of New Hampshire believes that environmental education is not only important but that it is essential.

However, environmental education that is limited only to schools will not provide the needed solutions to our immediate environmental problems. In fact, it will result in the environmental buck being passed to the next generation. Thus, the Council feels that environmental education is necessary for all citizens from school age through adult.

Many leading environmentalists have suggested that individual citizens and citizen groups can contribute more effectively to a better environment if they start in their own community, at the local level, and work to resolve local environmental problems. In addition, the results of the Council's environmental education needs assessment indicate that many New Hampshire citizens place greater emphasis on community action than they do on regional or statewide programs.[2] As a result, the Council believes that environmental education for New Hampshire is most likely to be implemented, and that it will be most meaningful if it is implemented, at the local level.

The purpose of this publication, *Environmental Education for New Hampshire: A Plan for Community Involvement*, is to:

--Define environmental education and comment on environmental education methodologies and facilities appropriate for use in school programs.

--Recommend courses of action essential to the realization of New Hampshire's priority environmental education needs.

--Outline a strategy for promoting citizen involvement in environmental education.

The Environmental Education Planning Council takes pride in presenting this plan to the citizens of New Hampshire and

urges all New Hampshire groups, agencies, communities, educational institutions and individuals to evaluate the Council's recommendations and to implement those recommendations which are consistent with their aims.

The Council extends a special thanks to each of the more than 500 New Hampshire citizens who worked with us during the past two years not only to develop this plan but also to pave the way for the implementation of environmental education in the schools and communities of our state.

References Cited

1. Reprinted from the Council's January 1972 proposal for funding, submitted to the U.S. Office of Environmental Education for support under PL 91-516.

2. *1973 Needs Assessment Report* issued as Addendum Number One to *Environmental Education for New Hampshire*, Environmental Education Planning Council of New Hampshire, Concord, N.H., August 1973.

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What good is a house
when there is no tolerable planet
to put it on.
—Henry David Thoreau

PLACES FOR K-TWELVE ENVIRONMENTAL EDUCATION[1]

Foreword

Man is the dominant organism on earth and can, through technological manipulations of the environment, control much of its condition and consequence. As a result, man is the central figure in environmental education. Whether he is cloistered in a subterranean bunker of experimental laboratories at the South Pole, comfortably nestled in an urban penthouse, or thousands of miles out in space, the environment is a crucial and significant factor in determining the quality of his life.

While technology has made life easier for us in many ways, it has also vastly altered the environment. A new life style is called for, based on the requirements of living within our environment. We must develop enlightened ways of living in harmony with nature and our world. Finding the way is not merely the government's responsibility. It is not only our neighbor's attitude and manner of living which needs alteration. It is our own.

One way to begin this new manner of thinking and of living is through environmental education: education aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution.

Environmental Education

Not all educators and planners agree on a definition of environmental education, but they know what environmental education is and what it is not.

Environmental education is:

--a new approach to teaching about man's relationship to his environment - how he affects and is affected by the world around him

--an integrated process dealing with man's natural and man-made surroundings

--experience-based learning using the total human, natural and physical resources of the school and surrounding community as an educational laboratory

--an interdisciplinary approach which relates all subject areas to a whole earth "oneness of purpose"

--oriented toward survival in an urban society

--life-centered and oriented toward community development

--an approach for developing self-reliance in responsible, motivated members of society

--a rational process to improve the quality of life

--geared toward developing behavior patterns that will endure throughout life

--a total look at where man lives, how he lives, and why he lives.

The consensus is that environmental education is not:

--conservation, outdoor resource management or nature study (although these areas may be included in an environmental education program)

--a cumbersome new program requiring vast outlays of capital and operating funds

--a self-contained course to be added to the already over-crowded curriculum

--merely getting out of the classroom.

The Methodology of Environmental Education

Two of the commonly used techniques for instruction in environmental education are centered around environmental encounters, developed by Dr. William B. Stapp of the School of Natural Resources at the University of Michigan, and the strand approach advocated by the National Park Service and detailed in the 1970 publication *Man and His Environment: An Introduction to Using Environmental Study Areas.*[2]

Environmental encounters are a series of experiences that focus the attention of elementary and secondary youth on the relationship of the economic, ecological, social, and political realities of living. These encounters are designed to provide environmental experiences at each grade level and are used to enhance and extend existing instructional programs. They are designed to be topical and relevant to the particular needs of individual schools, as well as to serve the environmental imperatives of the community. For example, the staff of one suburban school has developed a fifth-grade encounter on Investigating Septic Systems. It includes the study of disposal systems for human waste, a septic site installation visit, identifying community agencies charged with sewage disposal responsibility, and cost factors of different methods of disposal. A sixth-grade encounter in the same school investigates how the athletic field is watered, and the students study well drilling, water run-off, how water is transported, the costs of water, watershed problems, etc.

A major consideration of these encounters is that they fall into the normal range of challenge for children. They are neither too easy nor too hard, and involve the pupils in the selection and design of the encounter.

Encounters may focus upon basic resources such as land, air and water, as well as upon community environmental problems such as waste disposal, housing and recreation. Students in the high school environmental studies program at Manchester (N.H.) West High School have conducted a systematic investigation, including water testing, of the sources of pollution in the Merrimack River as it passes through Manchester. Their investigation has considered the problems associated with the disposal of both human and industrial waste. One result of their investigation was the successful law suit brought by the United States Attorney against a local industry. This company was fined for discharging animal blood and waste into the river.

The strand approach interweaves taxonomical classification and open-end research into all environmental learning so that students recognize that man and his environment are related to and dependent upon each other. It is a somewhat informal approach in which students limit their scientific vocabulary and teachers feel comfortable because they do not need any rigorous scientific education.

Whatever instructional approach is used, facilities for environmental education must be able to accommodate easily the instructional techniques inherent in the chosen philosophy.

Planning Environmental Education Facilities

Traditionally, the development of educational facilities has focused on problems of construction, site layout, land acquisition, access, and related factors. This approach to facility planning, while expedient, has produced school sites which do not necessarily lend themselves to optimum use as outdoor learning environments.

So, in planning programs and facilities for environmental education, planners should:

- --adapt the traditional school for use as a neighborhood environmental education facility, particularly in the limited space of urban areas
- --strive for cooperation between educators and planners in developing a site as an environmental study area
- --consider the following when developing any environmental facility:
    - --ensure specific educational possibilities
    - --include elements that illustrate the effects of human activity
    - --choose an area that is consistent with sound environmental and ecological practices
    - --select an area that is easily accessible to students
    - --provide the essentials for servicing the facility
    - --choose a site that will support repeated use by groups and students
- --institute a comprehensive program of teacher preparation, including knowledge of materials, concepts, and techniques of stimulating student learning and involvement
- --develop a design concept, involving architects, landscape architects, builders, educators, and those who will use the facility
- --develop a facility plan involving professionals, lay people, community organizations and students in the process
- --analyze program and personnel requirements
- --make inventories of existing resources and incorporate

them into the total design plan.

When included in a school construction bond issue, environmental study sites are eligible for New Hampshire School Building Aid.

Effective Use of Existing School Facilities

The existing school facility is the most immediately available resource for implementing an environmental education program. School administrators and those who control the purse strings cannot delay in initiating programs by hiding behind the current crises in educational financing. Effective programs can be mounted in existing school facilities. Adapting the immediate environment to create expanded learning opportunities is practical and economical. The school environment is easily accessible to the student; its quality familiar to him. Solving problems within this environment provides him with a sense of serving his immediate community.

To realize the full potential of the school facility as a learning laboratory, certain preliminary steps should be taken:

--recognize that the school plant and environs can be used for environmental studies

--inventory the school site and plant to identify available resources and determine how they can be best used, e.g. geographical characteristics of the site, physical features of the building, environmental problems on the site

--identify good and bad characteristics of the site, programs needed, facilities necessary for a comprehensive program

--determine site areas and nearby areas that can be developed

--invite student, faculty and community participation in the planning process, priority determination, and implementation

--establish an environmental studies laboratory within the plant

--reveal the school building's structure and mechanical services so students can see how the building works

William Stapp has said that "the potential for developing environmental education facilities (on any school site) is

limited only by the boundaries of one's imagination, resourcefulness, and enthusiasm."

Some possibilities, particularly in urban schools, are: a) a rooftop development for gardens, weather equipment, air pollution detection equipment, and sound pollution devices, b) courtyard development using partial enclosure, c) development of surrounding streets, d) using basement and service areas of the school to study heating, power sources, waste disposal, water circulation, etc. (the custodial staff becomes an important part of the pedagogical staff in this area), and e) studying traffic patterns in and around the school. In addition, tree planting, shrubbery, student sculpture, glacial boulders, and changes in textures and colors of surfacing material can contribute to the aesthetics of the site and at the same time provide sources for environmental study.

The Monadnock Regional High School of Swanzey Center (N.H.) has developed an environmental education program based upon full utilization of the total school site as a facility. The acreage around the school includes both natural and man-made areas. In this way trees, shrubs, wildlife, and other ecological realities, as well as man's effect on them, can be studied at first hand. Outdoor classrooms abound with environmentally oriented programs in many of the subject areas.

Using Total Community Resources

After exploring the potential of the immediate school facility, the next step is to look beyond the school environment and tap the learning resources of the community. Environmental education is an open process which knows no political, social, or geographic boundaries. By expanding the learning environment to include the community, it is possible to establish a system of environmental study areas and facilities that provide an overall view of where man lives and how he lives.

An environmental study area may be any site or facility - natural or man-made, park or urban setting, historical landmark or scenic site - used by a teacher to help students understand the relationships among the subject or concept being taught, the environment, and man. Resources that might be used for such purposes include libraries, shopping centers, the students' own neighborhood, courthouses, police and fire stations, sanitation and treatment plants, foundries, industrial parks, streams, nature centers, camps, museums, wildlife preserves - the list is practically endless. In addition, the use of such resources

often provides the means for involving the total community in environmental education programs.

For example, the Keene, Hanover and Concord public schools and the Derryfield School in Manchester use several community resources and facilities as sites for their programs in environmental education. For the past few years Concord (N.H.) students and teachers involved in the Concord SEE Project have organized several community-wide recycling projects and have involved the community in several other environmental programs. Among the community resources they use are supermarket parking lots, the city auditorium and library, the Merrimack River, the 500 acres around Turkey Pond owned by St. Paul's School, as well as the classrooms and site of each city school.

Regional Resources[3]

Since the environment knows no boundaries, it is as important for a farm boy to be aware of environmental principles as it is for his counterpart growing up in the inner city. Due to the increasing mobility of society, both boys will probably be exposed to a variety of environments during their lifetimes. While each must be primarily concerned with coping with his immediate environment, it is equally important that he gain a basic understanding of other environments which he someday will almost certainly encounter. Taken in this context, environmental education is cross-cultural.

One way to meet this need is to expose children of school age to a wide diversity of environments, both natural and man-made. In addition to the environmental study sites located in the local community, New Hampshire has many regional environmental study sites and centers. Among these are the Squam Lakes Science Center (Holderness), Odiorne Point State Park (Rye), the Regional Center for Educational Training (Hanover), the Monadnock Eco-Center (East Westmoreland), and the White Mountain National Forest. Several of the agencies which operate these facilities also offer in-service training programs for teachers.

The Resident Environmental Education Center

Another facility used for environmental education is the resident environmental education center or camp. One objective

of such a center is to put students in a new environment with people their own ages who may come from different home environments. The resident center also promotes closer interaction between teacher or leader and child or between parent and child. Customarily, the resident experience lasts for one week. More than twenty New Hampshire school districts participate in school camping programs at resident environmental education centers. This participation usually involves 5th and 6th grade students.

Two such centers in New Hampshire are the Otter Lake Conservation School in Greenfield and the Pembroke Environmental School located at the Conference Center in Pembroke. In addition, some 7th and 8th grade classes have used the facilities of the Appalachian Mountain Club's North Country Hut System, located at Pinkham Notch in Gorham, as a resident environmental education center.

Summary

In the summer of 1970 a conference to explore the implications of different types of facilities on environmental education programs was held at the Smithsonian Institution's Belmont Center. The EFL report, *Places for Environmental Education*, was distilled from the Belmont discussions. One further distillation by EFL enabled them to summarize the report in four statements which represent the consensus of the 26 nationally recognized authorities in disciplines related to environmental education who took part in that conference.

--Environmental education is not a passing fad. The world's environmental crises with their accompanying threats to human survival mandate that man begin to understand his role in the over-all scheme of existence. Establishing a harmonious balance between nature and what man himself has created dictates the content of environmental education. Affecting change should be an end product of all education, and is an absolute essential of effective environmental education.

--Facilities facilitate learning. Educators must become familiar with facilities that can best contribute to effective environmental education. Usually a variety of facilities will be required.

--The methodology of instruction in environmental education is probably best centered around an interdisciplinary approach. One successful approach puts students through

environmental encounters or experiences. A second approach interconnects a thematic strand through many aspects of a subject.

--Major capital expenditures are not necessary for schools to mount effective programs in environmental education. On the contrary, perhaps the most effective and successful programs use existing school plants and sites as the primary facilities for environmental studies. By expanding this concept for all existing community resources, and developing cooperative regional and district-wide plans, every school in the country should be able to enter the environmental education arena.

References Cited

1. Reprinted with modification and additions from the report *Places for Environmental Education*, issued in July 1971 by the Educational Facilities Laboratories, 477 Madison Avenue, New York, N.Y. 10022.

2. *Man and His Environment, An Introduction to Using Environmental Study Areas*. Association of Classroom Teachers, National Education Association, 1970. $1.75.

3. *Environmental Education Resources and Programs*, issued as Addendum Number Two to *Environmental Education for New Hampshire*, Environmental Education Planning Council of New Hampshire, Concord, N.H., September 1973.

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If - if he stood! Enough of ifs!
He knew a path that wanted walking;
He knew a spring that wanted drinking;
A thought that wanted further thinking;
A love that wanted re-renewing.
Nor was this just a way of talking
To save him the expense of doing.
With him it boded action, deed.

— Robert Frost,
A Lone Striker

RECOMMENDED COURSES OF ACTION

In August 1973 the Environmental Education Planning Council issued a report on its 1973 Environmental Education Needs Assessment.[1] The results contained in that document represent the opinions of the 452 New Hampshire citizens who were concerned enough to complete the Council's Needs Assessment Questionnaire. On the basis of their ratings the 22 goal statements and 22 implementation strategies contained in the questionnaire were arranged in rank order. The purpose of this section of *Environmental Education for New Hampshire* is to list recommended courses of action which the Council feels are essential for the successful realization of the needs which received the highest ratings (priority needs).

PRIORITY NEED ONE: TO ENCOURAGE THE DEVELOPMENT OF ENVIRONMENTAL EDUCATION PROGRAMS IN SCHOOLS AT ALL GRADE LEVELS, KINDERGARTEN THROUGH GRADE 12.

Recommendations:

1. INITIATION by all New Hampshire school districts of environmental education programs as outlined in the New Hampshire State Board of Education's Policy Statement Relative to Environmental Education (see Appendix).

2. PASSAGE of enabling legislation and APPROPRIATION of sufficient funds by the New Hampshire General Court so that the State Department of Education can APPOINT an educational consultant, who has broad environmental knowledge, to work full-time with administrators, teachers and citizens in the area of environmental education.

3. PROVIDE increased opportunities for both teachers and administrators to PARTICIPATE in in-service programs and workshops in environmental education.

4. INCLUSION by all New Hampshire colleges and universities of environmental education in their pre-service science and social studies instructional methods courses. Such instruction must provide prospective teachers with an environmental concern, relevant environmental information and reliable classroom techniques.

5. UTILIZATION in school programs of existing environmental education resources, materials, centers and sites.[2]

6. DEVELOPMENT and UTILIZATION of supplementary environmental education instructional materials related to New Hampshire for use both in classrooms and outdoors, in environmental study sites.

PRIORITY NEED TWO: TO PROMOTE TOTAL COMMUNITY INVOLVEMENT IN THE IDENTIFICATION AND SOLUTION OF LOCAL ENVIRONMENTAL PROBLEMS.

Recommendations:

1. INITIATION by all New Hampshire communities of educational programs which will involve citizens of all age levels in the identification of local environmental problems and the development and implementation of solutions to these problems (see Community Environmental Education Plan, page 19).

2. PROVIDE increased opportunities for elected, appointed and volunteer community leaders (including youth and service group leaders) to PARTICIPATE in educational programs and workshops which will provide them with relevant environmental information and community involvement techniques.

3. INVOLVEMENT of youth and youth groups in the implementation of action programs to improve the environment.

4. COMPILATION and DISSEMINATION of information about local, regional and statewide organizations, agencies, institutions and businesses which will provide speakers, literature, resource people and information or financial assistance to support local environmental activities.

5. PROVIDE local groups, organizations and agencies with technical assistance in the development and implementation of their goals and priorities.

PRIORITY NEED THREE: TO ENCOURAGE BOTH GOVERNMENTAL AND NON-GOVERNMENTAL DECISION MAKERS AT ALL LEVELS (INCLUDING THE INDIVIDUAL LEVEL) TO CONSIDER THE ENVIRONMENTAL IMPACT OF THEIR DECISIONS.

Recommendations:

1. PARTICIPATION by local groups, organizations, agencies and individuals in the DEVELOPMENT of regional comprehensive plans which incorporate environmental as well as economic and social issues.

2. PROVIDE increased assistance to environmentally concerned groups in the development and interpretation of environmental legislation.

3. INCLUSION by all New Hampshire colleges and universities of an interdisciplinary environmental studies course in their curricula. This course must be available for all students.

4. ESTABLISHMENT of a statewide center for the collection and dissemination of environmental information.

5. UTILIZATION by governmental agencies, educational institutions, businesses and industries of available technical data and environmental information.

6. UTILIZATION by local groups, organizations and agencies of professional assistance in planning water, air and land use.

7. PROMOTION OF RESEARCH which will provide local groups, organizations and agencies with assistance in solving local environmental problems.

PRIORITY NEED FOUR: TO ENCOURAGE INCREASED COMMUNICATION ON BOTH ENVIRONMENTAL PROBLEMS AND ENVIRONMENTAL EDUCATION PROGRAMS IN AN EFFORT TO DEVELOP AN ENVIRONMENTAL AWARENESS IN THE TOTAL POPULATION.

Recommendations:

1. DEVELOPMENT of increased channels for communication both within and between environmental agencies and organizations and with the public.

2. PLANNED AND ORGANIZED UTILIZATION of all mass media for increased environmental reporting aimed at examining all sides of an issue and for the DISSEMINATION of environmental information.

3. UTILIZATION, at the community level, of cable television for reporting on local environmental issues, problems and educational programs.

GENERAL RECOMMENDATIONS:

1. INITIATION of a program of regional workshops throughout the state to disseminate the publications of the Environmental Education Planning Council of New Hampshire and to promote the implementation of the Council's recommendations.

2. EVALUATION of the Council's recommendations by all New Hampshire groups, agencies, communities, educational institutions and individuals and IMPLEMENTATION by them of those recommendations which are consistent with their aims.

3. COORDINATION and EVALUATION by the Environmental Education Planning Council of New Hampshire or some similar group of both formal and non-formal environmental education at all levels in an effort to promote promising practices and avoid needless duplication of effort.

References Cited

1. *1973 Needs Assessment Report* issued as Addendum Number One to *Environmental Education for New Hampshire*, Environmental Education Planning Council of New Hampshire, Concord, N.H., August 1973.

2. *Environmental Education Resources and Programs*, issued as Addendum Number Two to *Environmental Education for New Hampshire*, Environmental Education Planning Council of New Hampshire, Concord, N.H., September 1973.

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We want to educate people in what nobody knew yesterday, and prepare people in our schools for what no one knows yet but which some people must know tomorrow.

—Margaret Mead

COMMUNITY ENVIRONMENTAL EDUCATION PLAN: AN ACTION MODEL FOR PROMOTING CITIZEN INVOLVEMENT IN ENVIRONMENTAL EDUCATION

As stated in the Introduction, the Environmental Education Planning Council believes that environmental education is necessary for all citizens from school age through adult. The Council further believes that environmental education will be most meaningful if it is community based and results in the identification of local environmental problems and the implementation of action programs which will solve them. In addition, the Council feels that effective action with lasting value must include more than pollution alerts and litter clean-up campaigns and that there are no instant solutions to our environmental problems.

The purpose of this section of *Environmental Education for New Hampshire* is to outline a strategy for the development, implementation and evaluation of community environmental education plans. This strategy is based on a model developed by Dr. William B. Stapp of the School of Natural Resources of the University of Michigan. His model has been effectively used to establish comprehensive environmental education programs in several school systems, from Yarmouth, Maine, to Toledo, Ohio.[1]

Strategy Outline

PHASE 1: ESTABLISH A COMMUNITY ENVIRONMENTAL EDUCATION COMMITTEE TO DEVELOP, IMPLEMENT, ADMINISTER, AND EVALUATE THE LOCAL ENVIRONMENTAL EDUCATION PLAN AND TO FACILITATE COMMUNICATION.

Select an environmentally concerned citizen with administrative talent to head the committee.

Membership of the committee could include: Conservation Commission members, Planning Board members, and other municipal

officials; school teachers and administrators; youth group leaders; members of local service clubs and conservation groups such as garden clubs; business, industrial, agricultural and labor leaders; local clergy; school board members; youth; retired citizens; and representatives of state and federal environmental agencies if they live in the community.

As they work to develop environmental education program goals for the community, the committee should make use of environmental education consultants. Such consultants are available from the State Department of Education and other state agencies, the Society for the Protection of N.H. Forests, the Audubon Society of N.H., the faculty and students of New Hampshire's colleges and universities, the Cooperative Extension Service, the Soil Conservation Service, etc.

PHASE 2: INVENTORY THE ENVIRONMENTAL RESOURCES AND IDENTIFY THE ENVIRONMENTAL PROBLEMS OF THE COMMUNITY.

A community inventory provides information useful to the community in planning its development and in seeking to prevent and resolve environmental problems, such as incompatible land use and loss of green space. It also provides a basis for establishing the goals of the Community Environmental Education Plan and for developing environmental education programs and activities related to local environmental issues and needs; as well as a reference for selecting community environmental studies sites.

The inventory process is, in and of itself, a learning experience.

PHASE 3: SELECT OVERALL ENVIRONMENTAL EDUCATION GOALS (OBJECTIVES) THAT THE COMMUNITY ENVIRONMENTAL EDUCATION PLAN WILL BE DESIGNED TO ACHIEVE.

Without a clear statement of goals, a Community Environmental Education Plan would become a series of unrelated experiences focused on limited program goals. One method for organizing goals is to formulate a general goal statement and then amplify it with several subgoal statements.

For example, one general goal of environmental education that a community plan might strive toward is to develop in citizens of all ages an awareness, understanding and concern for the community's environment and its associated problems; and the knowledge, skill, motivation and commitment to work toward solutions to these current and projected problems.

To achieve this general goal, structures and processes are needed to help citizens and citizen groups to:

--obtain an understanding that man is an inseparable part of an environmental system and that whatever he does alters his surroundings, as well as a basic knowledge of how environmental problems can be solved (cognitive subgoal)

--recognize the responsibility of individuals and each segment of society to cooperate in the solution of environmental problems (affective subgoal)

--develop thinking and action skills for the prevention and correction of environmental abuses (behavioral-skill subgoal)

This goal selection process should be expanded to include and encompass all of the environmental needs identified in Phase 2.

PHASE 4: DETERMINE THE NATURE AND EXTENT OF ENVIRONMENTAL EDUCATION PROGRAMS NOW OPERATING IN ALL AREAS OF THE UNITED STATES SO THAT PROMISING PRACTICES CAN BE ADOPTED AND ADAPTED FOR INCORPORATION INTO THE COMMUNITY ENVIRONMENTAL EDUCATION PLAN AND NEEDLESS DUPLICATION OF PROGRAM DEVELOPMENT EFFORTS CAN BE AVOIDED.

Consult *Environmental Education Programs and Resources* issued as Addendum Number Two to: *Environmental Education for New Hampshire.*

Review current environmental education literature (see Annotated Bibliography, page 27).

A recent review of the literature regarding theories of learning and instruction reveals the following points that should be considered in the formulation of any environmental education program.

--Behaviors that are positively reinforced are most likely to recur. Desired behaviors should be reinforced by the home, school, church, youth organizations, and so on.

--The most effective effort is put forth when individuals try tasks that fall in their range of challenge - not too easy and not too hard - where success seems likely but not certain

--Individuals are most likely to throw themselves wholeheartedly into any project if they themselves have had a

meaningful role in the selection and planning of the enterprise

--Reaction to excessive direction by program leaders is likely to be apathy, conformity, defiance, or escape

--What is learned is most likely to be available for use if it is acquired immediately preceding the time when it is needed. Learning, then forgetting, and then relearning when need arises is not an effective procedure

--The learning process in environmental education programs ought to involve dynamic methods of inquiry

--Learning takes place through the active behavior of the individual. It is what he does that he learns, not what the program leader does. The essential means of an education are the experiences provided, not the things to which the individual is merely exposed

--One of the keys to motivation is a sense of excitement about discovering for one's self, rather than having a generalization presented by a program leader and requiring an individual to prove it

--Helping citizens to acquire technical knowledge alone regarding an environmental problem may not increase their concern for the problem

--Citizens are most likely to become involved in environmental issues if they personally believe they can have some effect upon decision-making.

PHASE 5: ESTABLISH PROGRAM GOALS (OPERATIONAL OBJECTIVES) DESIGNED TO HELP CITIZENS OF ALL AGES ACHIEVE THE STATED ENVIRONMENTAL EDUCATION GOALS (OBJECTIVES) OF THE COMMUNITY ENVIRONMENTAL EDUCATION PLAN.

Program goals should be developed for the schools (see Appendix) and for other key community subgroups. Subgroups should be identified so that all citizens, with their varied interests and persuasions, will have the opportunity to become involved in the implementation of the Community Environmental Education Plan.

PHASE 6: SCHEDULE A COMMUNITY-WIDE MEETING FOR SCHOOL PERSONNEL, REPRESENTATIVES OF KEY COMMUNITY SUBGROUPS, AND ALL OTHER INTERESTED CITIZENS TO EXPLAIN THE COMMUNITY ENVIRONMENTAL EDUCATION PLAN, DISSEMINATE THE PROGRAM GOALS DEVELOPED IN PHASE 5, AND OBTAIN A COMMITMENT FROM THE VARIOUS SUBGROUPS THAT THEY WILL WORK TO IMPLEMENT THE PLAN.

This meeting will be successful only if the Community Environmental Education Committee has maintained active channels of communication, both for dissemination and feedback, with key community subgroups, the schools, and other interested citizens.

PHASE 7: DEVELOPMENT AND IMPLEMENTATION BY SCHOOLS AND KEY COMMUNITY SUBGROUPS OF ENVIRONMENTAL EDUCATION PROGRAMS AND ACTIVITIES WHICH WILL ACHIEVE THEIR PROGRAM GOALS AS DEVELOPED IN PHASE 5.

This phase can best be accomplished through the modification and utilization of the 10-Phase Strategy outlined in this section of *Environmental Education for New Hampshire.*

PHASE 8: DEVELOP A REINFORCING ENVIRONMENT.

It is imperative to keep in mind that to change an individual's beliefs, attitudes, values, and behavioral patterns, a strong reinforcing environment is normally required. For this reason, it is vital that the environmental education committee work with all community subgroups to identify methods which will enable subgroups to assist each other in accomplishing their environmental education program goals. It is also important that each subgroup make a continuous assessment of its own program in an effort to strengthen its environmental education contribution to the entire community (such as sponsoring seminars, producing materials, providing tours, giving presentations, offering technical assistance, providing services, etc.). In this manner, as youth and adults circulate daily in their community, they will be touched by environmental concerns from many sources. This type of community reinforcement is vital in both forming and changing attitudes, values, and behaviors.

One process which lends itself to community-wide cooperation and participation is the development of a community environmental studies site, primarily but not exclusively for use by schools and youth groups.

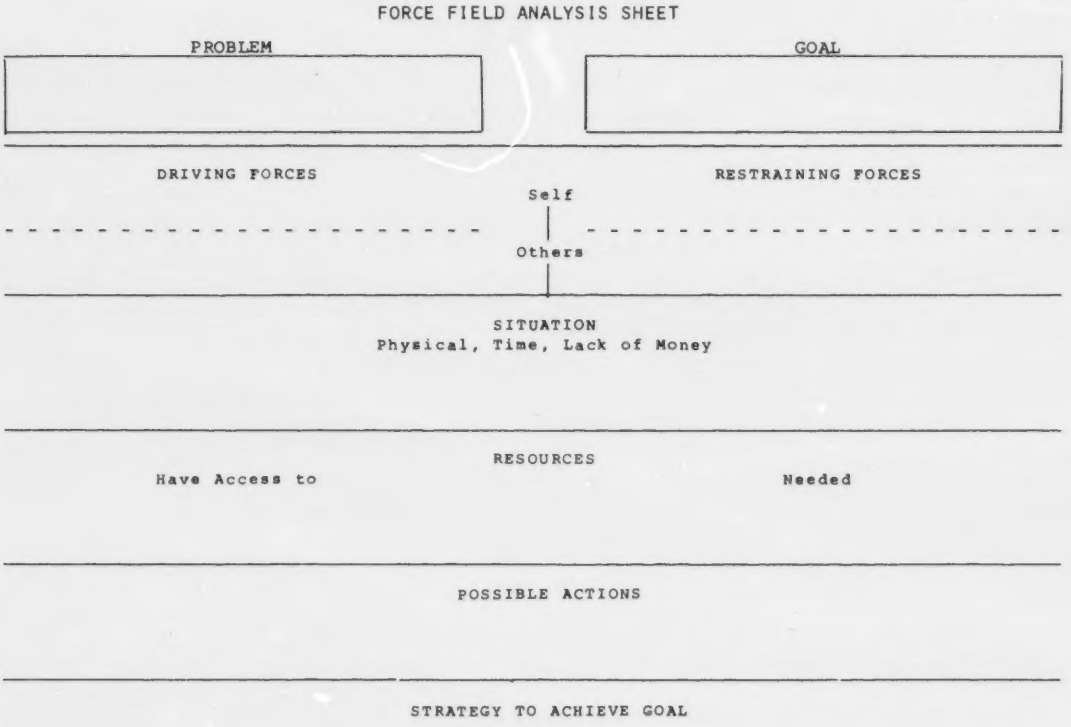
PHASE 9: IDENTIFY AND OVERCOME CONSTRAINTS WHICH WILL LIMIT THE SUCCESS OF THE COMMUNITY ENVIRONMENTAL EDUCATION PLAN.

If the Community Environmental Education Plan is to be fully implemented it is important that the environmental education committee identify problems (constraints) that need to be overcome. Once this is done, the committee could use a force field analysis to help resolve these constraints. In this process the first step is to clearly state each problem and a goal to help

overcome the problem. Next, assess the strengths (driving forces) and weaknesses (restraining forces) pertaining to the particular problem. Finally, identify possible actions and strategies to accomplish the goal by using the driving forces to overcome the restraining forces. Careful thought must be given to appropriate channels for implementing the proposed action.

In-service education programs for school personnel and other community subgroup leaders will overcome several constraints and help to insure the full implementation of the Community Environmental Education Plan.

The following is a sample Force Field Analysis Sheet.



PHASE 10: DEVELOP INSTRUMENTS TO EVALUATE THE EFFECTIVENESS OF THE ENVIRONMENTAL EDUCATION PROGRAM.

It is imperative that environmental education plans and programs be evaluated periodically to determine if their stated goals are being achieved. The results of the evaluation should be publicized so that the plan or program can be modified to reflect information derived from the evaluative instruments.

A well designed instrument for evaluating a comprehensive environmental education program was developed by Dr. Dean Bennett (1972) for the Environmental Education Program, Yarmouth, Maine. This instrument could be modified to meet the needs of many environmental education programs. It is important that evaluative instruments be as objective, reliable, and valid as is humanly possible.

It is vital that environmental education programs be evaluated and reported in the literature so that every school and community will not be forced to reinvent the wheel.

Concluding Statement

Arnold Toynbee, the distinguished world historian, has pointed out that 19 of the world's great civilizations died. "They died without knowing the reasons. If this civilization dies, it will not be because the reasons are not known, but it will be because we didn't care or because we didn't inform enough people to care!"

References Cited

1. *Developing an Environmental Education Program K-12*, Dr. William B. Stapp and Ellen Vande Visse. Michigan Environmental Education Association, c/o 820 Lakeland, Grosse Pointe, Michigan 48230. 1972.

Love is the most humanizing attribute in life. Extend it to the birds and the little people of field and woodland and it will react to the benefit of all mankind.

—Thornton Burgess, 1920

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ANNOTATED BIBLIOGRAPHY

OF SCHOOL AND COMMUNITY ENVIRONMENTAL EDUCATION

PROGRAM PLANNING MATERIALS

1. DEVELOPING AN ENVIRONMENTAL EDUCATION PROGRAM K-12, a September 1972 publication by Dr. William B. Stapp and Ellen Vande Visse of the University of Michigan's School of Natural Resources, presents a strategy for developing and implementing an environmental education program K-12. Emphasis is placed on goal selection, behavioral objective preparation and curriculum organization through the use of environmental encounters.

   Single copies of this 18-page publication are available at no cost from:

   Michigan Environmental Education Association
   c/o 820 Lakeland
   Grosse Pointe, Michigan 48230

2. A DIRECTORY OF PROJECTS IN ENVIRONMENTAL EDUCATION FOR ELEMENTARY AND SECONDARY SCHOOLS, compiled in 1972 by John F. Disinger of ERIC/SMEAC, describes more than 200 environmental education projects and programs. Primary criterion for inclusion was recommendation by the appropriate member of SMEAC's state coordinator group. Information was derived from questionnaires sent to each project director.

   This compilation, priced at $6.00 per copy with a 10 percent discount for more than 10 copies, is available from:

   ERIC Center for Science, Mathematics,
   and Environmental Education
   1460 West Lane Avenue
   Columbus, Ohio 43212

3. THE ENVIRONMENTAL EDUCATION COMMITTEE, developed in 1972 by the staff of the Maine Environmental Education Project, discusses the organization and operation of local environmental education committees made up of community citizens from both public and private sectors, school administrative personnel, teachers and youth.

   Single copies of this handbook are available at no cost from:

Maine Environmental Education Project
Title III, E.S.E.A.
Intermediate School
Yarmouth, Maine 04096

4. ENVIRONMENTAL EDUCATION/FACILITY RESOURCES, a July 1972 report from the Educational Facilities Laboratories developed by the National Education Association and National Park Service, tells how to tap the resources existing in the national parks, in schools, and in communities around them, and suggests ways to use these areas for effective programs in environmental education.

This 64-page booklet is available for $2.00 from:

Educational Facilities Laboratories
477 Madison Avenue
New York, N.Y. 10022

5. ENVIRONMENTAL EDUCATION INSTRUCTIONAL ACTIVITIES, K-6, and ENVIRONMENTAL EDUCATION INSTRUCTIONAL ACTIVITIES, 7-12, developed in 1970 under the direction of Barry W. Jamason, Chairman of the New York Department of Education's Environmental Education Task Force, suggest environmental education activities appropriate to the attainment of each of nine different concepts and generalizations.

Single copies of each of these 64-page activity guides were distributed in November 1971 to New Hampshire's elementary and secondary schools by the New Hampshire Department of Education.

6. ENVIRONMENTAL EDUCATION PROGRAMS AND MATERIALS issued as PREP Report 33, was adopted from the three target communications reports on environmental education developed jointly by ERIC/SMEAC and ERIC/ChESS. This 1972 report provides information about available environmental education materials and sources of curriculum ideas. It is designed to help educational personnel put research into educational practice.

This 99-page publication, priced at $1.00 per copy with a 25 percent discount for 100 or more copies mailed to the same address, is available from:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

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7. ENVIRONMENTAL EDUCATION PROGRAMS AND RESOURCES, a September 1973 publication of the Environmental Education Planning Council of New Hampshire, emphasizes New Hampshire resources and programs, and is designed to help individuals, schools, and communities get started in the development and implementation of environmental education programs by providing them with an answer to the question, "Where do I turn for help?"

   Single copies of this 41-page booklet are available at no cost from:

   Consultant, Science Education
   New Hampshire Department of Education
   64 North Main Street
   Concord, N.H. 03301

8. ENVIRONMENTAL EDUCATION STRATEGIES, developed in 1972 under the direction of Barry W. Jamason, Chairman of the New York Department of Education's Environmental Education Task Force, enumerates and illustrates numerous environmental education instructional techniques.

   Single copies of this 21-page handbook are available at no cost from:

   Environmental Education Task Force
   The University of the State of New York
   The State Education Department
   Albany, New York 12224

9. A GUIDE TO PLANNING AND CONDUCTING ENVIRONMENTAL STUDY AREA WORKSHOPS, developed in 1972 by the National Education Association and the National Park Service, contains instructions on how to plan and conduct an environmental education workshop and evaluate its effectiveness.

   This 50-page booklet is available for $2.25 from:

   National Education Association
   1201 16th Street, N.W.
   Washington, D.C. 20036

10. GUIDELINES FOR EVALUATING STUDENT OUTCOMES IN ENVIRONMENTAL EDUCATION, developed in 1973 by Dean B. Bennett, Director of the Maine Environmental Education Project, is intended for the teacher, the curriculum developer, the administrator and others who wish to examine critically the results of environmental education experiences.

Single copies of this 64-page manual are available at no cost from the Maine Environmental Education Project, same address as given in number 3.

11. GUIDELINES FOR PLANNING AND IMPLEMENTING A COMPREHENSIVE COMMUNITY ENVIRONMENTAL INVENTORY, developed in 1971-1972 by Dean B. Bennett and Richard H. MacGown of the Maine Environmental Education Project, contains instruction on how to carry out and utilize a comprehensive community environmental inventory.

Single copies of this 32-page manual are available at no cost from the Maine Environmental Education Project, same address as given in number 3.

12. THE JOURNAL OF ENVIRONMENTAL EDUCATION, devoted to research and development in ecological communications, is a magazine published four times a year which presents articles on all phases of environmental education. The subscription price is $10.00 per year.

Those interested should contact:

Dembar Educational Research Services, Inc.
Box 1605
Madison, Wisconsin 53701

13. MAN AND HIS ENVIRONMENT: AN INTRODUCTION TO USING ENVIRONMENTAL STUDY AREAS, a 1970 publication developed by the Association of Classroom Teachers, National Education Association, in cooperation with Project Man's Environment, is intended to help teachers expand their classrooms through the use of environmental study areas selected for their educational potential. It contains instructions on site selection and program planning through the use of the strand approach to environmental education.

This 56-page booklet, priced at $1.75 per copy with a 10 percent discount on 2-9 copies and a 20 percent discount on 10 or more copies, is available from the National Education Association, same address as given in number 9.

14. MANUAL FOR ENVIRONMENTAL AIDES, a 1971 publication developed by the Elbanobscot Foundation, is designed to help train volunteers to assist schools and communities in teaching environmental education, primarily out-of-doors. This manual of basic background material is also helpful to teachers and organization leaders who are responsible for providing environmental education programs and activities for children.

This resource document is available for $1.50 from:

Mrs. Richard Robinson
The Elbanobscot Foundation
Weir Hill Road
Sudbury, Massachusetts 01776

15. A MANUAL FOR A VOLUNTEER FIELD AIDE PROGRAM, a 1973 publication prepared by Allie Quinn, Education Chairman of the Hanover Conservation Council, is useful both as a training manual for volunteer field aides to be utilized in school programs and as an outdoor education guide for elementary teachers.

Single copies of this 66-page resource document were distributed in April 1973 to New Hampshire's elementary schools by the New Hampshire Department of Education in cooperation with the New Hampshire Charitable Fund. Additional copies are available for $1.50 each from:

Regional Center for Educational Training
Wilson Hall
Hanover, New Hampshire 03755

16. ORGANIZATION AND OPERATION OF A K-12 ENVIRONMENTAL EDUCATION PROGRAM, developed during 1969-1972 by Dean B. Bennett and Wesley H. Willink of the Maine Environmental Education Project, describes the structure and function of the Yarmouth, Maine, environmental education program.

Single copies of this 21-page publication are available at no cost from the Maine Environmental Education Project, same address as given in number 3.

17. OUTDOOR CLASSROOMS ON SCHOOL SITES, a January 1972 publication prepared by the Soil Conservation Service of the U.S. Department of Agriculture, provides suggestions for the selection, development and use of the school site as an environmental study area.

This 22-page guide is available for 25¢ from the Superintendent of Documents, same address as given in number 6.

18. A REVIEW OF RESEARCH RELATED TO ENVIRONMENTAL EDUCATION, by Robert E. Roth and Stanley L. Helgeson of ERIC/SMEAC and issued in September 1972, identifies and reviews 87 studies having relevance to environmental education. The majority of these studies, reported from 1950-1970, were oriented toward outdoor or conservation education, thus being forerunners of environmental education as it is currently viewed.

This 50-page review, priced at $1.50 per copy with a 10 percent discount on more than 10 copies sent to the same address, is available from ERIC/SMEAC, same address as given in number 2.

19. SCHOOL SITE DEVELOPMENT FOR CONSERVATION AND OUTDOOR EDUCATION, prepared in 1969 by Eleanor H. Bennett, Conservation and Outdoor Education Advisor for the Pennsylvania Department of Education, presents guidelines for the selection of outdoor education areas, procedural steps for developing an outdoor laboratory and interdisciplinary suggestions for its use.

Single copies of this 15-page handbook are available at no cost from:

Bureau of General and Academic Education
Pennsylvania Department of Education
Box 911
Harrisburg, Pennsylvania 17126

20. SMEAC ENVIRONMENTAL EDUCATION NEWSLETTER is a periodic publication of the ERIC Information Analysis Center for Science, Mathematics, and Environmental Education. It contains current environmental education news as well as annotated references on recent environmental education publications.

This newsletter is available at no cost from ERIC/SMEAC, same address as given in number 2.

APPENDIX

Policy Statement Relative to Environmental Education

Adopted by the New Hampshire State Board of Education,
January 13, 1971

The deterioration of the quality of our environment and of its ecological balance is proceeding rapidly. Technology and population continue to expand in alarming proportions with little concern for future implications. In sum, man threatens to destroy his habitat.

This deterioration is in part due to poor understanding of our environment and of the necessity for ecological balance. There is an increasing awareness of the need to protect and restore the environment from the unforeseen consequences of our individual and collective acts. Yet, more people must be made aware of this need, if we hope to influence practical decision making by government, industry and individual citizens. Therefore, we must educate everyone about the environment.

The State Board and the State Department of Education, in their role of responsibility for programs of education in the schools, recommend the development and implementation of environmental education programs which will assist students in developing an awareness of and a responsibility to the environment. Each school district in the state is encouraged to identify its own environmental problems and develop programs which seek to solve those problems. The personnel of the State Department of Education are available to assist local districts as they identify environmental problems, develop programs and plan for in-service education.

The following guidelines are suggested to assist local districts in developing environmental education programs:

1. AN INTERDISCIPLINARY APPROACH. Environmental education goes beyond the facts and processes of ecology. Our environmental problems are social, scientific, economic, cultural and humanistic. Therefore, environmental education programs should make a deliberate effort to coordinate and involve all disciplines.

2. A K-12 PROGRAM. Environmental education should be an integral part of the school curriculum and extend from elementary school through continuing education. In the elementary years children can be exposed to a variety of experiences that will contribute to their understanding of the environment and an appreciation of its beauty and value. At the secondary level students may become involved with community problems and those factors that affect the environment. Through continuing education, citizens can become better informed about current environmental problems and be motivated to solve such problems.

3. PROCESS ORIENTATION AND IMPORTANCE OF OUTDOOR CLASSROOMS. New Hampshire teachers and students have an extremely diversified and accessible selection of environmental study sites. These include mountains, forests, lakes and streams, the seashore, and the streets of our towns and cities. Environmental education should provide direct experiences for students in such outdoor classrooms and expand those experiences to develop generalizations involving world-wide environmental phenomena. The data collected from the real environment provides the most accurate raw materials with which students can develop the skills and processes necessary for solving meaningful problems and for making intelligent decisions.

4. ATTITUDES AND VALUES. Environmental education is an extension of ethics and should modify attitudes and values to develop an environmental concern. This concern not only involves the individual and his personal interest but his interrelationships with others and society, even the survival of society.

5. A COOPERATIVE APPROACH. Local school districts should make every effort to coordinate their activities with and take advantage of the assistance provided by the industries, businesses, and public and private agencies in New Hampshire that are concerned with the environment.

6. SCHOOL SYSTEM RESPONSIBILITIES. School systems are encouraged to make the following conditions possible:

   A. Provide outdoor environmental study trips for real life experiences such as: on-campus and off-campus walks to observe the natural environment, polluted and degraded areas, man-made environment, and industrial sites; and off-campus trips to science centers or resident outdoor education camps.

   B. Provide enabling facilities to conduct environmental studies such as adequate science classroom laboratories and outdoor environmental study sites.

   C. Provide in-service education to assist teachers and administrators in developing an environmental concern and to provide them with relevant environmental information and reliable classroom techniques.

   D. Provide continuous environmental education experiences K-12 which expand upon understandings, skills and attitudes that are based on maturity and growth.

   E. Provide opportunities for the involvement of students and teachers in individual and group activities and in action programs for the improvement of the local environment.

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I long for wildness...
Woods where the woodthrush forever sings,
Where the hours are early morning ones,
And there is dew on the grass,
And the day is forever unproven...
A New Hampshire everlasting and unfallen.
—Henry David Thoreau